

CLAIMS

What is claimed is:

1. A method of accessing information about a resource associated with a network device, comprising:
 3. receiving a request from an application for information about a resource associated with a network device;
 5. selecting a layer in a network protocol stack having multiple layers for communicating with the requested resource associated with the network device;
 7. establishing an inner layer socket for communicating at the selected layer using an inner layer application programming interface (IL API) and a socket identifier associated with the requested resource, wherein the inner layer socket communicates using the selected layer and bypasses other layers in the network protocol stack;
 11. transmitting the request for information about the resource through the inner layer socket and the socket identifier ;
 13. receiving the information about the resource in response to the transmission made through the inner layer socket; and
 15. passing the information about the resource through the inner layer socket to the application making the request.
1. 2. The method of claim 1, wherein said request includes header information associated with a transport layer and the inner layer socket is a transport socket.
1. 3. The method of claim 2, wherein the network protocol stack is compatible with TCP/IP and the transport socket is compatible with a TCP or UDP transport layer protocol.
1. 4. The method of claim 1, wherein said request includes header information associated with a network layer and the inner layer socket is a network socket.
1. 5. The method of claim 4, wherein the network protocol is compatible with TCP/IP and the network socket is compatible with an IP network layer protocol.
1. 6. The method of claim 1, wherein said request includes header information associated with a link layer and the inner layer socket is a link socket.

3 7. The method of claim 6 wherein the network protocol is compatible with
4 TCP/IP and the link socket is compatible with a link layer protocol.

1 8. The method of claim 1 wherein selecting a layer in a network protocol stack
2 further includes determining the layer in the network protocol stack that the requested
3 resource uses for communication.

1 9. The method of claim 1 wherein the IP layer in a TCP/IP network protocol is
2 selected when a Internet Control Message Protocol (ICMP) resource communicates at the
3 network layer in the network protocol.

1 10. The method of claim 1 wherein the link layer in a TCP/IP network protocol is
2 selected when an Address Resolution Protocol (ARP) resource communicates at the link
3 layer in the network protocol.

1 11. The method of claim 1 wherein the physical layer in a network protocol is
2 selected when a physical port resource uses the physical layer for communication.

1 12. The method of claim 1 wherein the IL API provides a transport socket to
2 access transport layer information in the network protocol, a network socket to access
3 network layer information in the network protocol, a link socket to access link layer
4 information in the network protocol, and a physical socket to access physical port
5 information in the network protocol.

1 13. The method of claim 1 wherein the IL API provides a different socket
2 communication interface for each layer of communication available in the network protocol.

1 14. The method of claim 1 wherein an application communicates with the IL API
2 using object -oriented instructions and the IL API interfaces with the network protocol
3 through instructions executable on a virtual-machine compatible with the network protocol
4 stack.

1 15. The method of claim 13 wherein the object-oriented instructions are
2 compatible with the Java programming language.

1 16. An apparatus for accessing information about a resource associated with a
2 network device, comprises:
3 a processor;
4 a memory for storing instructions when executed on the processor that causes the
5 processor to,
6 receive a request from an application for information about a resource associated with
7 a network device;
8 select a layer in a network protocol stack having multiple layers for communicating
9 with the requested resource associated with the network device;
10 establish an inner layer socket for communicating at the selected layer using an inner
11 layer application programming interface (IL API) and a socket identifier associated with the
12 requested resource, wherein the inner layer socket communicates using the selected layer and
13 bypasses other layers in the network protocol stack;
14 transmit the request for information about the resource through the inner layer socket
15 and the socket identifier ;
16 receive the information about the resource in response to the transmission made
17 through the inner layer socket; and
18 pass the information about the resource through the inner layer socket to the
19 application making the request.

1 17. The apparatus of claim 16, wherein said request includes header information
2 associated with a transport layer and the inner layer socket is a transport socket.

1 18. The apparatus of claim 17 wherein the network protocol stack is compatible
2 with TCP/IP and the transport socket is compatible with a TCP or UDP transport layer
3 protocol.

1 19. The apparatus of claim 16, wherein said request includes header information
2 associated with a network layer and the inner layer socket is a network socket.

1 20. The apparatus of claim 19 wherein the network protocol is compatible with
2 TCP/IP and the network socket is compatible with an IP network layer protocol.

1 21. The apparatus of claim 16, wherein said request includes header information
2 associated with a link layer and the inner layer socket is a link socket.

1 22. The apparatus of claim 21 wherein the network protocol is compatible with
2 TCP/IP and the link socket is compatible with a link layer protocol.

1 23. The apparatus of claim 16 wherein selecting a layer in a network protocol
2 stack further includes determining the layer in the network protocol stack that the requested
3 resource uses for communication.

1 24. The apparatus of claim 16 wherein the IP layer in a TCP/IP network protocol
2 is selected when a Internet Control Message Protocol (ICMP) resource communicates at the
3 network layer in the network protocol.

1 25. The apparatus of claim 16 wherein the link layer in a TCP/IP network
2 protocol is selected when an Address Resolution Protocol (ARP) resource communicates at
3 the link layer in the network protocol.

1 26. The apparatus of claim 16 wherein the physical layer in a network protocol is
2 selected when a physical port resource uses the physical layer for communication.

1 27. The apparatus of claim 16 wherein the IL API provides a transport socket to
2 access transport layer information in the network protocol, a network socket to access
3 network layer information in the network protocol, a link socket to access link layer
4 information in the network protocol, and a physical socket to access physical port
5 information in the network protocol.

1 28. The apparatus of claim 16 wherein the IL API provides a different socket
2 communication interface for each layer of communication available in the network protocol.

1 29. The apparatus of claim 16 wherein an application communicates with the IL
2 API using object -oriented instructions and the IL API interfaces with the network protocol
3 through instructions executable on a virtual-machine compatible with the network protocol
4 stack.

1 30. The apparatus of claim 29 wherein the object-oriented instructions are
2 compatible with the Java programming language.

1 31. An apparatus for accessing information about a resource associated with a
2 network device, comprising:

3 means for receiving a request from an application for information about a resource
4 associated with a network device;

5 means for selecting a layer in a network protocol stack having multiple layers for
6 communicating with the requested resource associated with the network device;

7 means for establishing an inner layer socket for communicating at the selected layer
8 using an inner layer application programming interface (IL API) and a socket identifier
9 associated with the requested resource, wherein the inner layer socket communicates using
10 the selected layer and bypasses other layers in the network protocol stack;

11 means for transmitting the request for information about the resource through the
12 inner layer socket and the socket identifier ;

13 means for receiving the information about the resource in response to the
14 transmission made through the inner layer socket; and

15 passing the information about the resource through the inner layer socket to the
16 application making the request.

1 32. A computer program, tangibly stored on a computer-readable medium,
2 comprising instructions for accessing information about a resource associated with a network
3 device, comprising:

4 receiving a request from an application for information about a resource associated
5 with a network device;

6 selecting a layer in a network protocol stack having multiple layers for
7 communicating with the requested resource associated with the network device;

8 establishing an inner layer socket for communicating at the selected layer using an
9 inner layer application programming interface (IL API) and a socket identifier associated
10 with the requested resource, wherein the inner layer socket communicates using the selected
11 layer and bypasses other layers in the network protocol stack;

12 transmitting the request for information about the resource through the inner layer
13 socket and the socket identifier ;

14 receiving the information about the resource in response to the transmission made
15 through the inner layer socket; and

16 passing the information about the resource through the inner layer socket to the
17 application making the request.